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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,366	07/01/2003	Kenkichi Shimomura	2611-0192P	1162

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
LEE, DAVID J	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/609,366	SHIMOMURA ET AL.	
	Examiner	Art Unit	
	David Lee	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/22/05, 7/1/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. ("Duobinary carrier-suppresssed return-to-zero format...", Optical Society of America, hereinafter referred to as "Miyamoto-OSA") in view of Hait (US Pub. No. 2002/0131134 A1)

Regarding claim 1, Miyamoto-OSA teaches an optical transmitter, comprising an optical modulation processing unit (fig. 1) that includes: a signal carrier-suppressed pulse modulating unit that performs signal carrier-suppressed pulse modulation on a light source signal to thereby create a carrier-suppressed-return-to-zero signal ("CS-RZ pulse generator" of fig. 1); a phase modulating unit that performs phase modulation on a data signal based on the carrier-suppressed-return-to-zero signal to thereby convert the data signal into a phase-modulated signal ("optical duobinary data-modulator" of fig. 1; see also first paragraph of pg. 2). Miyamoto-OSA does not expressly disclose an optical filtering unit that filters out redundant frequency components included in the phase-modulated signal. However, it is well known in the art to filter out redundant frequency components in order to efficiently utilize bandwidth and prevent channel interference. For example, Hait discloses an optical transmission system (fig. 1) comprising a

filter that filters redundant frequency components (paragraph 0062). It would have been obvious to a skilled artisan at the time of invention to incorporate an optical filtering unit that filters out redundant frequency components in the system of Miyamoto-OSA in order to improve bandwidth efficiency and prevent interchannel cross-talk.

Regarding claim 2, Miyamoto-OSA teaches that the signal carrier-suppressed pulse modulating unit performs the signal carrier-suppressed pulse modulation based on a clock signal of a frequency that is determined by a signal frequency of the data signal, and creates the carrier-suppressed-return-to-zero signal such that peaks of an optical frequency spectrum are separated from each other by the signal frequency (see first paragraph of pg. 2, e.g. line 5 – note that the clock signals are synchronized with the system clock); and the optical filtering unit filters out all frequency components that fall outside a frequency band determined by the signal frequency (see second paragraph of pg. 2, e.g. lines 1-3 – note that each of the frequency components are filtered out except for the respective frequency of the received channel).

Regarding claim 4, Miyamoto-OSA teaches that the optical modulation processing unit further includes a differential coding unit that performs differential-coding on the data signal (see first paragraph of pg. 3: Reed-Solomon FEC encoding is considered to comprise differential-coding).

Regarding claim 5, Miyamoto-OSA teaches that the signal carrier-suppressed pulse modulating unit is a Mach-Zender interferometer optical modulator (see "MZ#1" of fig. 1 and first paragraph of pg. 2).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto-OSA in view of Hait and in further view of Way (US Pub. No. 2002/0021464 A1).

Regarding claim 3, Miyamoto-OSA teaches the limitations of claim 1 but does not disclose that there are a plurality of modulation processing units whose outputs are multiplexed with an optical combining unit. However, this type of network configuration is well known and widely used in the art. For example, Way teaches a transmission network comprising a plurality of modulation processing units (20, 24 of fig. 1) whose outputs are multiplexed with an optical combining unit (26 of fig. 1). It would have been obvious to a skilled artisan at the time of invention to use a plurality of modulation units and multiplex the outputs in order to efficiently transmit large amounts of data from multiple sources.

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (EP 0 977 382 A2, hereinafter referred to as "Miyamoto-EP") in view of Ito (US Patent No. 6,650,846 B1) and Hait and in further view of Way (US Pub. No. 2002/0021464 A1).

Regarding claim 6, Miyamoto-EP teaches an optical transmitter, comprising an optical modulation processing unit (fig. 26) that includes: a signal carrier-suppressed pulse modulating unit that performs signal carrier-suppressed pulse modulation on a light source signal to thereby create a carrier-suppressed signal (31, 32 of fig. 26); a phase modulating unit that performs phase modulation on a data signal based on the carrier-suppressed signal to thereby convert the data signal into a phase-modulated carrier-suppressed return-to-zero signal (40 of fig. 26; see also paragraph 45). Miyamoto-EP does not disclose that the pulse modulating unit is positioned after the phase modulating unit. However, it is well known to interchange the positions of pulse

modulating units and phase modulating units. For example, Ito from a similar field of endeavor teaches two embodiments of an optical modulation processing unit. A first embodiment shows the phase modulating unit positioned after the pulse modulating unit (fig. 13) and a second embodiment shows the units in reverse order (fig. 14). It would have been obvious to a skilled artisan at the time of invention to position the pulse modulating unit after the phase modulating unit in order to allow for the implementation of other modulation techniques and to improve modulation performance. Miyamoto-EP does not expressly disclose an optical filter to filter out redundant frequencies. However, it is well known in the art to filter out redundant frequency components in order to efficiently utilize bandwidth and prevent channel interference. For example, Hait discloses an optical transmission system (fig. 1) comprising a filter that filters redundant frequency components (paragraph 0062). It would have been obvious to a skilled artisan at the time of invention to incorporate an optical filtering unit that filters out redundant frequency components in the system of Miyamoto-EP in order to improve bandwidth efficiency and prevent interchannel cross-talk.

Regarding claim 7, Miyamoto-EP teaches that the signal carrier-suppressed pulse modulating unit performs the signal carrier-suppressed pulse modulation based on a clock signal of a frequency that is determined by a signal frequency of the data signal (see paragraph 0081), and creates the carrier-suppressed-return-to-zero signal such that peaks of an optical frequency spectrum are separated from each other by the signal frequency (see paragraph 0045 and 0081); and the optical filtering unit filters out all frequency components that fall outside a frequency band determined by the signal frequency (these are undesired frequencies).

Regarding claim 8, Miyamoto-EP teaches the limitations of claim 6 but does not disclose that there are a plurality of modulation processing units whose outputs are multiplexed with an optical combining unit. However, this type of network configuration is well known and widely used in the art. For example, Way teaches a transmission network comprising a plurality of modulation processing units (20, 24 of fig. 1) whose outputs are multiplexed with an optical combining unit (26 of fig. 1). It would have been obvious to a skilled artisan at the time of invention to use a plurality of modulation units and multiplex the outputs in order to efficiently transmit large amounts of data from multiple sources.

Regarding claim 9, Miyamoto-EP teaches that the optical modulation processing unit further includes a differential coding unit that performs differential-coding on the data signal (1 of fig. 26).

Regarding claim 10, Miyamoto-EP teaches that the signal carrier-suppressed pulse modulating unit is a Mach-Zender interferometer optical modulator (paragraph 0029).

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DL

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER